the relationship between HIA and systemic serum biomarkers in MS.

Categories: Multiple Sclerosis/ALS/Demyelinating Disorders
Keyword 1: neuroimaging: structural
Keyword 2: multiple sclerosis
Keyword 3: hippocampus
Correspondence: Christopher Collette, the University of Alabama at Birmingham Heersink School of Medicine, ccollette@uabmc.edu

31 Finding the Link Between Inflammatory Biomarkers and Cognitive Functioning in People with Multiple Sclerosis

Katherine Ward, Christopher Collette, Amani M Norling, Hyun Freeman, Terina Myers, Khurram Bashir, Ronald M Lazar, Adam Gerstenecker
The University of Alabama at Birmingham, Birmingham, AL, USA

Objective: To investigate the relationship between systematic inflammatory biomarkers and cognition in patients with Multiple Sclerosis (MS).
Participants and Methods: We recruited 36 patients diagnosed with MS (31 with relapsing-remitting and 5 with progressive) who presented for treatment at the University of Alabama at Birmingham (UAB). Patients underwent a comprehensive neuropsychological battery, and serum blood samples were collected. Cognitive data was divided into an overall Cognitive Composite score and seven cognitive domains (i.e., Attention, Verbal Memory, Visual Memory, Visuospatial Ability, Language, Processing Speed, and Executive Function) using z-score averages. Pearson's product-moment correlations were conducted to determine the relationship between cognitive performance and 14 inflammatory biomarkers specifically chosen for their potential role in MS.
Results: Granulocyte Colony Stimulating Factor (G-CSF) was significantly correlated with Executive Function (r= -.355; p=.039) and Processing Speed (r= -.528; p= .001) scores. Additionally, Interleukin-10 (IL-10) was significantly correlated with Visual Memory (r= -.346; p= .041) scores. Finally, Tumor Necrosis Factor (TNF-α) was significantly correlated with Visual Memory (r= -.347; p= .041).
Conclusions: Studies investigating associations between inflammation and cognition in MS are lacking. In our sample of persons with Multiple Sclerosis, G-CSF biomarkers were negatively correlated with Executive Function as well as Processing Speed. In addition, IL-10 and TNF-α biomarkers were negatively correlated with Visual Memory scores. These findings in a representative sample of patients with MS highlight the need for further research exploring the relationship between systematic inflammatory biomarkers and cognition in MS.

Categories: Multiple Sclerosis/ALS/Demyelinating Disorders
Keyword 1: cognitive functioning
Keyword 2: multiple sclerosis
Correspondence: Katherine Ward, The University of Alabama at Birmingham, katherinecward@uabmc.edu

32 Impacts of Multiple Sclerosis on Verbal Learning and Memory in Aging

Daliah Ross[1], Roee Holtzer[1,2]
[1]Ferkauf Graduate School of Psychology, Yeshiva University, Bronx, NY, USA.
[2]Department of Neurology, Albert Einstein College of Medicine, Bronx, NY, USA

Objective: Multiple sclerosis (MS), an inflammatory autoimmune disease of the central nervous system, is characterized by damage to white matter via myelin degeneration with resulting sclerotic plaques and lesions. Upwards of 70% of people with MS show cognitive changes in multiple domains including verbal memory. Advances in disease-modifying therapies have increased the expected lifespan of people with MS, making aging with MS a critical emerging area of study. Memory declines during normal aging, yet the specific impact of MS on verbal memory in aging is inconclusive and understudied. To address this gap in knowledge, we examined whether MS was associated with verbal learning slope, total learning, delayed recall, and recognition performance in older adults. We further explored whether MS disease severity influenced these memory operations.

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Participants and Methods: Participants included two cohorts: older adults with MS recruited from MS centers and patient registries, and healthy controls recruited from the community. A total of 164 adults age 60 and older without dementia were included in the current study, 79 in the MS group (mean age = 65.05 + 4.72; %female = 62) and 85 in the control group (mean age = 69.53 + 6.65; %female = 65.9). All participants were administered a neuropsychological battery including the Hopkins Verbal Learning Test-Revised (HVLT-R). The Patient Determined Disease Steps (PDDS), a patient-rated score of disability severity in MS comprised of eight steps related to walking ability, was used to operationalize MS severity. Using a median split, the PDDS was dichotomized into low (PDDS = 0-2) versus high (PDDS = 3-5) MS severity groups. Linear regression models were run to examine the effect of group (MS vs. control) and disease severity (PDDS) on four operations from the HVLT-R: learning slope, total learning, delayed recall, and recognition. Statistical analyses adjusted for age, years of education, and sex.
Results: Linear regression models revealed that older adults with MS showed lower total learning compared to healthy controls (ß = -.18, p = .03). Learning slope, delayed recall, and recognition did not differ by group (p > .05). Compared to healthy controls, older adults with high MS severity performed worse on total learning (ß = -.21; p = .01) and delayed recall (ß = -.18; p = .03). Group differences on learning slope and recognition were not significant (p > .05).
Conclusions: The presence of MS was associated with worse total learning. Moreover, high severity of MS was associated with worse total learning and delayed recall in older adults. These results delineate the influence of MS on specific memory operations and emphasize the potential utility of disease severity on cognitive performance in aging.

Categories: Multiple Sclerosis/ALS/Demyelinating Disorders
Keyword 1: multiple sclerosis
Keyword 2: memory disorders
Keyword 3: aging disorders
Correspondence: Daliah Ross, Ferkauf Graduate School of Psychology, Yeshiva University, dross3@mail.yu.edu

33 Amyotrophic Lateral Sclerosis with and without Bulbar Onset: Cognitive and Behavioral Findings from an Outpatient Sample

Dov B Gold, Kendal L Maxwell
Cedars Sinai Medical Center, Los Angeles, California, USA

Objective: The relationship between frontotemporal dementias (FTDs) and amyotrophic lateral sclerosis (ALS) is well established and is believed to be more pronounced in those with bulbar onset ALS (B-ALS). This study compared cognitive and behavioral symptoms among persons with B-ALS to those of individuals with nonbulbar phenotypes (NB-ALS).
Participants and Methods: Outpatient clinic data collected during an initial neuropsychology consultation at an ALS interdisciplinary clinic in an academic medical center was retroactively analyzed. All individuals were diagnosed with ALS by neurologists specializing in movement and neuromuscular disorders based on results of neurological/motor examination, electromyographies, and (when available) genotypic data. Total scores on the short form of the Montreal Cognitive Assessment (MoCA-SF) and scores on the ALS Cognitive Behavioral Screen (ALS-CBS) and ALS CBS Caregiver questionnaire were of focus. 22 B-ALS and 44 NB-ALS individuals were compared on said measures using univariate analyses while controlling for ALS symptoms duration.
Results: B-ALS individuals scored significantly lower on the MoCA-SF ($F(2)=3.15$, $p=0.05$, $\eta2=0.13$) and the tracking subscale of the ALS-CBS ($F(2)=3.50$, $p=0.04$, $\eta2=0.17$). The groups were not significantly different on other ALS-CBS measures, including caregiver-rated behavior questionnaire.
Conclusions: Consistent with previous research, this study found lower total scores on a brief screener of global cognition and tasks of tracking requiring cognitive control in those with B-ALS relative to NB-ALS individuals. Interestingly, despite behavioral variant being the most prevalent FTD phenotype, the groups did not differ significantly in terms of caregiver-rated behavioral changes. It is hypothesized that the absence of these differences could reflect effects of gradual loss of speech and functionality that secondarily limit caregivers' abilities to observe behavioral changes

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